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Approved for use through 10/31/2002. OMB 0651-0031 U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE Paperwork Reduction Action of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number. Application Number 09/941,453 ute for form 1449A/PTO Filing Date 08/28/2001 INFORMATION DISCLOSURE First Named Inventor: Fang-Cheng Chang STATEMENT BY APPLICANT Examiner name: J. Mancuso Mahamedulla GROUP: 2623 /757 (use as many sheets as necessary) Attorney Docket Number of NTI-024 Sheet Technology Center 2600 U.S. PUBLISHED APPLICATION DOCUMENTS Name of Patentee or Applicant of Date of Publication Pages, Columns, Lines Cited U.S. Patent Document Examiner Kind Code 2 Cited Document of Cited Document Where Relevant Info. Initials\* No. 1 Number MM-DD-YYYY (if known) Appear 06/21/2001 A1 Ito A01 2001/0004122 215W 06/28/2001 A02 2001/0005619 A1 Hasebe et al. SRUM **U.S. PATENT DOCUMENTS** Name of Patentee or Applicant of Date of Publication Pages, Columns, Lines Examiner Cited U.S. Patent Document Kind Code 2 of Cited Document Where Relevant Info. Initials\* No. 1 Number Cited Document MM-DD-YYYY Appear (if known) Nowak et al. 01/28/1997 B01 5597668 XVVII FOREIGN PATENT DOCUMENTS Foreign Patent Document Date of Pages, Columns, Publication of Lines Where Тé Kind Code 5 Name of Patentee or Applicant Cited Document Relevant Info. Examiner Cited No. 1 Office3 Number4 of Cited Document MM-DD-YYYY Initials\* (if known) Appear OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

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<sup>&</sup>lt;sup>1</sup>Unique citation designation number. <sup>2</sup>See attached Kinds of U.S. Patent Documents. <sup>3</sup>Enter Office that issued the document by the two-letter code (WIPO Standard ST.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language Translation is attached.

SHEET 1 of 2

INFORMATION DISCLOSURE
CITATION

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Atty. Docket No. NTI-024 Serial No.

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CHANG, Fang-Cheng

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U.S. PATENT DOCUMENTS						
EXAMINER'S INITIALS	PATENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
Sem	6,016,357	1/18/2000	Neary, et al.	382	144	6/16/1997
SW	6,023,328	2/8/2000	Pierrat	356	237.4	2/23/1998
87/m	6,076,465	6/20/2000	Vacca, et al.	101	481	9/19/1997
8RM	6,091,845	7/18/2000	Pierrat, et al.	382	144	2/24/1998
8RM	6,272,236	8/7/2001	Pierrat, et al.	382	144	7/18/2000
SVW	6,334,209 B1	12/25/2001	Hashimoto, et al.	716	21	9/2/1999
8Pin	2002/0019729 A1	2/14/2002	Chang, et al.	703	6	8/7/1998

## **RECEIVED**

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INFORMATION DISCLOSURE **CITATION** 

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CHANG, Fang-Cheng

Filing Date

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8/28/2001

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	FOREIGN PATENT DOCUMENTS							
EXAMINER'S INITIALS	PATENT NO.	DATE		COUNTRY	CLASS	SUBCLASS	YES	NO
Ser	WO 97/13370	4/10/1997	wo		~			
8m	WO 98/20327 ·	5/14/1998	wo	· -				
8200	WO 98/45685 .	10/15/1998	wo	DEC				
8Mm	WO 99/38002	7/29/1999	wo	וחבע	LIVE	J		
SW	WO 99/56113 .	11/4/1999	wo	AU	G 2 0 2002			
EVIN.	WO 99/59200	11/18/1999	wo	Technol	pay Center	2600		
8NM	WO 99/67626 ·	12/29/1999	wo	Toomo	<del></del>	~		
8VM	WO 99/14706 A2/A3	3/25/1999	wo		)	/		

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FORMATION DISCLOSURE **CITATION** 

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CHANG, Fang-Cheng

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Not Ye Tachnology Center 2600

	OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)
EXAMINER'S INITIALS	CITATION
	Spence, C., et al., "Detection of 60(degree) Phase Defects on Alternating PSMs", Advanced Micro Devices, KLA-Tencor, DuPont RTC (2 pages).
	Ogawa, K., et al., "Phase Defect Inspection by Differential Interference", Lasertee Corporation (12 pages).
	Socha, R., et al., "Printability of Phase-Shift Defects Using a Perturbational Model", Univ. of California Berkeley, Sematech (11 pages).
	Fiekowsky, P., "The End of Thresholds: Subwavelength Optical Linewidth Measurement Using the Flux-Area Technique", Automated Visual Inspection (6 pages).
8m	Watanabe, H., et al., "Detection and Printability of Shifter Defects in Phase-Shifting Masks", Japanese Journal of Applied Physics, Vol. 30, No. 11B, pp. 3016-3020, November 1991.
89M	Hosono, K., et al., "A Novel Architecture for High Speed Dual Image Generation of Pattern Data for Phase Shifting Reticle Inspection", SPIE - Integrated Circuit Metrology, Inspection, and Process Control VI, Vol. 1673, pp. 229-235 (1992).
8M	Ohtsuka, H., et al., "Evaluation of Repair Phase and Size Tolerance for a Phase-Shift Mask", J. Vac. Sci. Technol. B, Vol. 11, No. 6, pp. 2665-2668, November/December 1993.
SOM	Reynolds, J., "Elusive Mask Defects: Reflectivity Variations", Solid State Technology, pp. 75-76, March 1995.
M	Kusunose, H., et al., "Direct Phase-Shift Measurement with Transmitted Deep-UV Illumination", SPIE, Vol. 2793, pp. 251-260 (1996).
	Fiekowsky, P., et al., "Defect Printability Measurement on the KLA-351: Correlation to Defect Sizing Using the AVI Metrology Systems, SPIE 19th Annual BACUS Symposium on Photomask Technology and Management Conference, pp. 1-6, September
<b>D</b> u	Tejnil, E., et al., "Option for At-Wavelength Inspection of Patterned Extreme Ultraviolet Lithography Masks", SPIE Bacus '99, pp. 1-12 (1999).
8h	Hemar, S., et al., "Finding Killer CD Variations by Full-Reticle CD Mapping", Microlithography World, pp. 4, 6, 8 & 10 (Summer 2000).

EXAMINER:	Mohamedulla	Date Considered:	3/21/05	
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INFORMATION DISCLOSURE ECITATION

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Atty. Docket No.

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						<u> </u>
EXAMINER'S INITIALS	PATENT NO.	DATE	NAME	CLASS	SUBCLASS	FILIN <b>®</b> DATE
SRM	5,326,659	7/5/1994	Liu, et al.	430	5	3/5/1992
1	5,340,700	8/23/1994	Chen, et al.	430	312	11/3/1993
	5,432,714	7/11/1995	Chung, et al.	364	525	9/2/1994
	5,572,598	11/5/1996	Wihl, et al.	382	144	2/25/1994
	5,795,688	8/18/1998	Burdorf, et al.	430	30	8/14/1996
	5,801,954	9/1/1998	Le, et al.	364	488	4/24/1996
	5,804,340	9/8/1998	Garza, et al.	430	5	12/23/1996
	5,815,685	9/29/1998	Kamon	395	500	9/15/1995
	5,825,647	10/20/1998	Tsudaka	364	167.03	3/12/1996
	5,849,440	12/15/1998	Lucase, et al.	430	5	1/29/1997
1	5,862,058	1/19/1999	Samuels, et al.	364	491	5/16/1996
	5,900,338	5/4/1999	Garza, et al.	430	5	8/15/1997
	6,009,250	12/28/1999	Ho, et al.	395	500.06	9/30/1997
	6,009,251	12/28/1999	Ho, et al.	395	500.06	9/30/1997
	6,011,911	1/4/2000	Ho, et al.	395	500.06	9/30/1997
	6,078,738	6/20/2000	Garza, et al.	395	500.22	5/8/1997
V	6,081,659	6/27/2000	Garza, et al.	395	500.22	4/26/1999
SRM	6,171,731 B1	1/9/2001	Medvedeva, et al.	430	5	1/20/1999

EXAMINER: Mohamedulla	Date Considered:	3/21/05
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SHEET 2 of 5

INFORM O 1 P MAR 1 9 2	ECITATION TO-1449	Atty. Docket No.  NTI-024  O9/941,45  Applicant  CHANG, Fang-Cheng  Filing Date  8/28/2001  Atty. Docket No.  Serial No.  09/941,45  Group  Not Yet A		/941,453-6 <b>26</b>	MAK Center 26	RECEIVED	ころの	
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EXAMINER'S INITIALS	PATENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	YES	NO	
SPM	WO 00/36525 A2	6/22/2000	wo .		1			
SRM	WO 00/67074 A1	11/9/2000	wo					
SRM	WO 00/67075 A1	11/9/2000	wo					
SPM	WO 00/67076 A1	11/9/2000	wo					

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EXAMINER'S		- (Including Fluction)	, Date, 1 or timent 1 ages, Diet.)			
INITIALS		<del></del>				
	Cobb, et al., "Fast Sparse Aerial Image Ca	Iculation for OPC", SPIE, Vol. 2	621, pp. 534-544.			
	Colorina V and ROusial Piles Madala	as Describe ICT isk-amelia Deb	Purising Companying Parkers Owner (10			
	pages).	to Describe IC Lithographic Ben	navior", Precim Corporation, Portland, Oregon (10			
	Sugawara, M., et al., "Defect Printability Study of Attenuated Phase-Shifting Masks for Specifying Inspection Sensitivity", Sony					
	Corporation, Kanagawa, Japan (16 pages).					
,	Adam, K., et al., "Simplified Models for Edge Transitions in Rigorous Mask Modeling", University of California Berkeley (40					
	pages).					
	Gordon, R., et al., "Mask Topography Sim	ulation for EUV Lithography", F	INLE Technologies Inc. (15 pages).			
	Pistor, T., "Rigorous 3D Simulation of Pha	ase Defects in Alternating Phase-	Shifting Masks", Panoramic Technology Inc. (13			
	pages).					
	Semmier, A., et al., "Application of 3D EM Masks", Infineon Technologies AG (12 pa	•	and Optimization of Alternating Phase Shifting			
	Wong, A., et al., "Polarization Effects in N	Mask Transmission", University o	of California Berkeley (8 pages).			
	Neureuther, A., et al., "Modeling Defect-F	ceature Interactions in the Presence	ce of Aberrations", University of California Berkeley			
SOM	Casey, Jr., J.D., et al., "Chemically Enhances 3236, pp. 487-497 (1997).	ced FIB Repair of Opaque Defect	ts on Molybdenum Silicide Photomasks", SPIE, Vol.			
SPW	Mathur, B.P., et al., "Quantitative Evaluati Electron Devices, Vol. 35, No. 3, pp. 294-	• •	esist of Square Apertures", IEEE, Transactions On			
Stein	Neureuther, A., "Modeling Phase Shifting (1990).	Masks", SPIE, 10th Annual Sym	posium On Microlithography, Vol. 1496, pp. 80-85			
8KW	Henke, W., et al., "A Study of Reticle Defi the Solid Lithography Simulator", Microel		onal Developed Profiles of Positive Photoresist Using 297 (1991).			
44	Wiley, J., et al., "Phase Shift Mask Pattern	Accuracy Requirements and Ins	pection Technology", SPIE, Integrated Circuit			

EXAMINER: Mohamedulla

5MV

Date Considered:

3/21/05

Metrology, Inspection, And Process Control V, Vol. 1464, pp. 346-355 (1991).

		Atty. Docket No.	Serial No.	
INFORMATION DISCLOSURE		NTI-024	09/941,453-6364	
INFORMATION DISCLOSURE		Applicant	Co w C	
/0	20	CHANG, Fang-Cher	is the same of the	
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12	3	Filing Date	Group 1757	
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	OTHER DOCUMENTS	(Including Author, Title, I	Date, Pertinent Pages, Etc.)	
EXAMINER'S INITIALS	CITATION			
AM	Ham, Y.M., et al., "Dependence of Defects	s in Optical Lithography", Jpn. J. Appl	. Phys., Vol. 31, pp. 4137-4142 (1992).	
SPW	Ohtsuka; H., et al., "Phase Defect Repair N Appl. Phys., Vol. 31, pp. 4143-4149 (1992	<u> </u>	sks Conjugate Twin-Shifter Method", Jpn. J.	
8Kn	Watanabe, H., et al., "Detection and Printa Appl. Phys., Vol. 31, pp. 4155-4160 (1992)		ing Masks II Defocus Characteristics", Jpn. J.	
SPh	Crisalle, O., et al., "A Comparison of the Optical Projection Lithography Simulators in SAMPLE and PROLITH", IEEE, Transactions On Semiconductor Manufacturing, Vol. 5, No. 1, pp. 14-26, February 1992.			
Span	Nistler, J., et al., "Phase Shift Mask Defect Printability Analysis", Proceedings Of The Microlithography Seminar INTERFACE '93, OCG Microelectronic Materials, Inc., pp. 11-28 (1993).			
	Rieger, M., et al., "System for Lithography Proximity Compensation", Precim Company, Portland, Oregon, September 1993 (28)			
	pages).			
SPM	Wiley, J., et al., "Device Yield and Reliability by Specification of Mask Defects", Solid State Technology, Vol. 36, No. 7, pp. 65-66, 70, 72, 74, 77, July 1993.			
Sen	Nistler, J., et al., "Large Area Optical Design Rule Checker for Logic PSM Application", SPIE, Photomask And X-Ray Mask Technology, Vol. 2254, pp. 78-92 (1994).			
An	Pati, Y.C., et al., "Phase-Shifting Masks for Microlithography: Automated Design and Mask Requirements", J. Opt. Soc. Am., Vol. 11, No. 9, pp. 2438-2452, September 1994.			
8M	Spence, C., et al., "Automated Determination of CAD Layout Failures Through Focus: Experiment and Simulation", SPIE, Vol. 2197, pp. 302-313 (1994).			
Sh	Qian, Q.D., et al., "A New Scalar Planewave Model for High NA Lithography Simulations", IEEE, pp. 45-48 (1994).			
84	Karklin, L., "A Comprehensive Simulation Study of the Photomask Defects Printability", SPIE, Vol. 2621, pp. 490-504 (1995).			
8/2	Wiley, J., et al., "The Effect of Off-Axis III 2512, pp. 432-440 (1995).	lumination on the Printability of Opaq	ue and Transparent Reticle Defects", SPIE, Vol.	
Shlin	Brunner, T., et al., "Approximate Models for Resist Processing Effects", SPIE, Vol. 2726, pp. 198-207, March 1996.			

examiner: moha medulla	Date Considered:	3/21/05	
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		Atty. Docket No.	Serial No.	
INFOR	MATION DISCLOSURE	NTI-024	09/941,453-6364	
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	<del></del>	(Including Author, Title	, Date, Pertinent Pages, Etc.)	
EXAMINER'S INITIALS	CITATION			
m	Chang, K., et al., "Accurate Modeling of D	Peep Submicron Interconnect Techn	ology", TMA Times, Vol. IX, No. 3 (1997).	
m	Gans, F., et al., "Printability and Repair Techniques for DUV Photomasks", SPIE, Proceedings Of The 17th Annual Symposium On Photomask Technology And Management, Vol. 3236, pp. 136-141 (1997).			
8kh	Ibsen, K., et al., "Clear Field Reticle Defect Diposition for Advanced Sub-Half Micron Lithography", SPIE, Proceedings Of The 17th Annual Symposium On Photomask Technology And Management, Vol. 3236, pp. 124-135 (1997).			
Oln	Pati, Y.C., et al., "Exploiting Structure in Fast Aerial Image Computation for Integrated Circuit Patterns", IEEE Transactions On Semiconductor Manufacturing, Vol. 10, No. 1, pp. 62-74, February 1997.			
8ven	Vacca, A., et al., "100nm Defect Detection Using a Dynamically Programmable Image Processing Algorithm", SPIE, Vol. 3236 (1997) (Abstract Only).			
8Ph	Kubota, H., et al., "A Fast Method of Simu Phys., Vol. 37, pp. 5815-5820 (1998).	lating Resist Pattern Contours Base	d on Mean Inhibitor Concentration", Jpn. J. Appl.	
Sen	Vacca, A., et al., "100nm Defect Detection Using an Existing Image Acquisition System", SPIE, Vol. 3236, pp. 208-21 (1998).			
870h	Fukuda, H., et al., "Determination of High-Order Lens Aberration Using Phase/Amplitude Linear Algebra", J. Vac. Sci. Technol. B, Vol. 17, No. 6, pp. 3318-3321, November/December 1999.			
Spew			0.3um Pitch, Proximity Effect Free, Random, pp. 3291-3295, November/December 1999.	
SNM	Balasinski, A., et al., "A Novel Approach to 37.6.1-37.6.4 (1999).	o Simulate the Effect of Optical Pro	ximity on MOSFET Parametric Yield", IEEE, pp.	
	Balasinski, A., et al., "Comparison of Mask	Writing Tools and Mask Simulation	ons for 0.16um Devices", IEEE, SEMI Advanced	

EXAMINER: Mohamedula	Date Considered:	3/21/05
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Semiconductor Manufacturing Conference, pp. 372-377 (1999).

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SHEET 1 of 3

INFORMATION DISCLOSURE
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Applicant

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Serial No.

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U.S. PATENT DOCUMENTS

		•	0.0.1.112200021.			
EXAMINER'S INITIALS	PATENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
SVM	6,130,750	10/10/2000	Ausschnitt, et al.	356	401	8/28/1997
· Slem	6,346,426 B1	2/12/2002	Toprac, et al.	438	8	11/17/2000

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**Technology Center 2600** 

EXAMINER:	Mohamedulla	
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NTI-024

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CHANG, Fang-Cheng

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**U.S. PATENT DOCUMENTS** 

EXAMINER'S INITIALS	PATENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
SNA	2002/0164064 A1	11/7/2002	Karklin, et al.	382	145	3/20/2001
svi~	2002/0164065 A1	11/7/2002	Cai, et al.	382	149	3/20/2001

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**Applicant** 

CHANG, Fang-Cheng

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Group

8/28/2001

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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

EXAMINER'S CITATION INITIALS

<)Un

Lin, B.J., et al., "Single-Level Electric Testsites for Phase-Shifting Masks", SPIE, Vol. 1673, pp. 221-228, March 9-11, 1992.

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DEC 1 1 2002

Technology Center 2600

EXAMINER: Mohamedolla

Date Considered:

3/21/05